

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borner et al (US Pat. No 6,234,648).

Regarding claims 1 and 10-11, Borner teaches a color mixing lighting system having a light-emitting diode (6, 7,8) emitting first visible light having a first peak wavelength in a first spectral range, a fluorescent material (10) converting a portion of the first visible light into second visible light having a second peak wavelength in a second spectral range (col. 2, line 10, range of 400 to 500).

Borner discloses the invention as claimed but doesn't explicitly teach the second visible light having a full width at half maximum (FWHM) of at least 50 nm. But, Borner teaches that a second spectral range of 400-500. That means a difference of 100nm and half of 100nm would be (FWHM) of 50nm which meets the limitation of claim 1. Regarding claim 10, Borner doesn't explicitly teach that a color rendering index of at least 90. But,

Borner teaches that one of the aspect of his invention is to achieve a high color rendering index on the basis of three basic colors RGB (col. 1, lines 64-67, and col. 2, lines 1-44).

Furthermore, It would have been obvious to one having ordinary skill in the art at the time the invention was made to achieve the desired range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering an optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233, *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 2 & 12, Borner further teaches that the second visible light is red light, the second peak wavelength being in the range from 590 to 630 nm [fig 2, (b)].

Regarding claim 3, & 13, Borner further teaches that the second peak wavelength is in the range from 600 to 615 nm [fig. 2, (b)].

Regarding claim 4,& 14, Borner further teaches that the first visible light emitting diode (6) emits blue light, the first peak wavelength being in the range from 445 to 470 nm and the full-width at half maximum (FWHM) being in the range from 15 to 30 nm [fig. 2, (a)].

Regarding claim 5 & 15, Borner further teaches a further light-emitting diode (7) for emitting third visible light having a third peak wavelength in a third spectral range (fig. 2, (c)).

Regarding claim 6 & 16, Borner further teaches a light-emitting diode (7) emits green light, the third peak wavelength being in the range from 510 to 550 nm and the full width at half maximum (FWHM) being in the range from 25 to 45 nm [fig. 2, c] .

Regarding claim 7 & 17 Borner further teaches that the fluorescent material (10) converts blue light into red light, the fluorescent material being selected from the group formed by SrS:Eu , $\text{Sr}_2\text{SiS}_4\text{Ns:Eu}$, CaS:Eu , $\text{Ca}_2\text{SiS}_4\text{N}_8 : \text{Eu}$, $(\text{Sr}_{1-x}\text{Ca}_x) \text{S:Eu}$ and $(\text{Sr}_{1-x}\text{Ca}_x)_2\text{SiS}_4\text{Ns:Eu}$ and $(x = 0.0\text{-}1.0)$ [col. 2, lines 16-20, and lines 53-56].

Regarding claim 8 & 18, Borner further teaches that fluorescent material (10) converting a portion of the first visible light into third visible light having a third peak wavelength in a third spectral range with the third peak wavelength in the range from 510 to 550 nm and a FWHM of at least 40 nm [fig. 2].

Regarding claim 9 & 19, Borner further teaches that fluorescent material (10) converts blue light into green light, the fluorescent material being selected from the group formed by $(\text{Ba}_{1-x}\text{Sr}_x) \text{2SiO}_4\text{:Eu}$ ($x = 0\text{-}1$, preferably $x = 0.5$), $\text{SrGa}_2\text{S}_4\text{:Eu}$, $\text{Lu}_3\text{AlSiO}_{12}\text{:Ce}$ and $\text{SrSi}_2\text{N}_2\text{O}_2\text{:Eu}$ [col. 2, lines 16-20].

Response to Arguments

Applicant's arguments filed on 12/21/07 have been fully considered but they are not persuasive. Applicant argues that claims 1-9 were rejected under 35 U.S.C. 102(b). Examiner strongly disagrees because the claims 1-9 were rejected under U.S.C. 103(a) over Borner et al in view of case law (*In re Aller*, 105 USPQ 233, *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Furthermore, applicant fails to point out how his invention differs from the Borner et al. Therefore the rejection of claims 1-9 and newly added claims of 10-19 stand rejected under same rejection.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Ali Alavi** whose telephone number is **(571) 272-2365**. The examiner can normally be reached between 7:00 A.M. to 5:30 P.M. Tuesday to Friday. If attempts to reach the examiner by phone are unsuccessful, the examiner's supervisor, Sandy O'Shea can be reached at (571) 272-2378 or you may fax your inquiry to the **Central Fax at (571) 273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you

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have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Ali Alavi/

Primary Examiner, Art Unit 2875